

FIG. 1

Biomass

High-concentration sulfuric acid

1 Spraying/mixing

2 Kneading

3 Pretreatment

4 Saccharification treatment

Washing filtrate

Washing water

5 Filtration

Lignin

Filtrate

6 Sugar-acid separation

Saccharification liquid sulfuric acid

7 Monosaccharification treatment

Sugar liquid

8 Sulfuric acid recovery/concentration

High-concentration Sulfuric acid

FIG. 2

Biomass

High-concentration sulfuric acid

1 Spraying/mixing

2 Kneading

3 Pretreatment

4 Saccharification treatment

Washing filtrate

Washing water

Low-concentration sulfuric acid

5 Filtration

Lignin

Filtrate

6 Sugar-acid separation

Saccharification liquid

Low-concentration sulfuric acid

High-concentration sulfuric acid

7 Monosaccharification treatment

Sugar liquid

8 Sulfuric acid concentration

Low-concentration sulfuric acid

High-concentration sulfuric acid

FIG. 3

biomass

High-concentration sulfuric acid

Water for hydrolysis

Hydrolysis slurry

FIG. 4

Biomass

Decrystallization (1)

Hydrolysis (1)
Filtration (1)
Solid
Filtrate (1)
Filtrate (2)
Sugar-acid separation
Sugar liquid
Decrystallization (2)
Hydrolysis (2)
Filtration (2)
Lignin
Sulfuric acid